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FIFTH SERIES.                      No. 2.                      APRIL, 1922

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*Original Communications.*

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## VENOUS THROMBOSIS AND GASTRIC CARCINOMA.\*

BY T. GILMAN MOORHEAD.

IN the fourth volume of his *Lectures on Clinical Medicine* Trousseau, in discussing the differential diagnosis between chronic gastritis, simple ulcer of the stomach, and gastric cancer, refers to the importance as a diagnostic sign of the occurrence of obliterative phlebitis. He states that if, when in doubt as to the nature of an affection of the stomach, one observes a vein to become inflamed in the arm or leg, all doubt may be dispelled and a positive diagnosis of cancer may at once be made. He returns to the subject in a later lecture in Volume V. on Phlegmasia Alba Dolens, and there expresses the opinion that phlegmasia may occur as a symptom of cancer anywhere within the body. This phlebitis, he points out, is by no means always due to direct pressure of tumour masses upon veins, but is probably the result of "a special crasis of the blood, which irrespective of inflammation, favours intravenous coagulation."

In spite of this strongly expressed opinion the diagnostic value of intravenous thrombosis as a sign of visceral malignant

\* Read before the Section of Medicine, Royal Academy of Medicine in Ireland, January 27, 1922.

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disease seems hardly to have attracted the attention that it deserves, or rather it appears that, while universally admitted to be a not unusual phenomenon in states of advanced cancerous cachexia, it is hardly realised that it may occur as a comparatively early symptom, or even as the earliest symptom of a latent carcinoma. In this connection Blumer, in his article on Thrombosis in Osler's System of Medicine may be quoted. He says: "The multiple thrombi which occasionally occur in gastric cancer, and to which the French School attach some diagnostic significance, are so unusual that they need merely be mentioned." He adds, indeed, that in all forms of malignant disease, thrombosis is not unusual, and as an explanation of the occurrence suggests that in some cases it is due to great enfeeblement of the circulation, in others to changes in the blood itself, and in still others to a terminal microbial infection. A still further occasional explanation is an actual extension of tumour cells into the vessel wall and blood stream.

During the last twelve months a series of four cases <sup>are</sup> which came under my observation attracted my attention forcefully to the condition and impressed me with the accuracy of Trousseau's observation and judgment.

The first case belongs to the rare group of cases of latent carcinoma of the stomach in which the first symptom to attract attention is the peripheral thrombosis.

M— P—, a dock labourer, aged 43, presented himself at hospital on the evening of May 26th complaining of a painful swelling on the right side of his neck, which he stated had appeared four days previously. He denied having received any injury, and said that he had been quite well and able to do his work until the swelling had appeared. He could not account in any way for his trouble. The only previous illness that he admitted to was an attack of pneumonia about a year ago from which he made a perfect recovery.

He was at first admitted to the Surgical Wards under the care of Dr. Corkey, who found that the painful swelling was due to thrombosis of the internal jugular vein; the thrombosed part extended from behind the clavicle upwards for a distance of about two inches; the skin over the swelling was red, and there was much tenderness on pressure. Apart from this

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swelling nothing abnormal was found and as he appeared to be a medical rather than a surgical case I was asked to take charge of him on the following day.

When I first examined the patient I found that he was a rather small-sized but vigorous looking man ; the thrombosis had now extended in the neck up to the angle of the jaw. and as some swelling of the right hand had appeared there was evidence of extension into the axillary and perhaps innominate vein. The possibility of malignant disease either in the thorax or abdomen at once suggested itself, but neither from the patient's account of his symptoms, nor as a result of a complete examination, including screening of the thorax, could any certain diagnosis be arrived at. The only abnormality in fact which I detected was an extremely septic mouth, and for lack of any other diagnosis I suggested the possibility that the thrombosis was septic in origin and secondary to the pyorrhœa.

In the course of the next few days a blood culture was made and proved negative ; a Wassermann test was also negative ; and a blood examination showed a normal count of both red and white cells. On the chance of the condition being as I had suggested, septic in origin, I ordered an injection of anti-streptococcic serum, followed by a daily injection of collosol manganese ; and proceeded to endeavour to get the patient's mouth into a cleaner condition.

For a couple of days there was no improvement ; severe dyspnœa was experienced at night and the right arm became extremely oedematous ; the right axillary and brachial vein also became thrombosed and palpable. Then apparent improvement set in : the swelling of the arm began to subside ; the enlargement in the neck became much smaller and was no longer tender, and the patient who, by the way, had been eating well throughout, begged permission after a week's treatment to be allowed out of bed. This I at first refused, but a few days later he was so insistent that I gave permission to get up for about half-an-hour. Before the actual time to get up arrived, however, he quite suddenly after his dinner got an attack of dyspnœa again, and so was not allowed out of bed. When I saw him the next day, the 11th June, I found him looking decidedly worse : he was rather cyanosed and

breathless, and a swelling had appeared on the left side of the neck. I now also found for the first time slight dulness at the base of the left lung. During the next few days this dulness rapidly increased, and on the 16th June I removed 30 ozs. of clear serous fluid. Meantime the entire jugular vein on the left side had become thrombosed and the left arm was extremely swollen and painful. On June 18th there was evidence of fluid in both pleural cavities; on June 22nd I again tapped the left pleura in order to relieve increasing urgent dyspnœa. On June 23rd the patient for the first time complained of some pain in the abdomen, just above the umbilicus, and felt some nausea. Next day, at my morning visit he was obviously in extremis, and he died at 2 p.m. on June 24th. During the last week of his life severe dyspnœa, cough with muco-purulent and occasional blood-stained expectoration, and pain in both arms combined to produce a condition of extreme misery which could only be alleviated by the free use of morphia.

The post-mortem showed an unexpected and typical cancer of the stomach extending from the cardiac end along the lesser curvature towards but not to the pylorus. The surface of this growth was ulcerated. No secondary growths were found in any viscera, but there was cancerous enlargement of the posterior abdominal lymph glands. The lungs showed diffuse pneumonic consolidation; the lower lobes were collapsed owing to the pleural effusions already referred to. Apart from the multiple thrombi nothing else requires note. These thrombi involved the veins already mentioned in the clinical report, and on section neither cancer cells nor micro-organisms were found. Owing to the ulceration of the gastric growth it is, however, more than likely that the thrombosis was in fact the result of microbial invasion of this broken surface.

*a* This case, <sup>cases of</sup> then, belongs, as already stated, to the rare group of latent cancer of the stomach with peripheral venous thrombosis as the earliest, and indeed only, prominent symptom throughout. ~~It~~

A fairly complete search through the literature has only enabled me to find records of three similar cases, unless one includes one or perhaps two of those to which Trousseau refers. The first of these three cases was reported (*Trans.*,

*Path. Soc., London*, vol. 43, 1892) by Turner, under the title "Destructive Adenoma of the Stomach with Thrombosis of Right Innominate Vein." This was the case of a man aged 44 who had suffered from hæmatemesis two years prior to coming under observation. When first seen at the London Hospital he had no gastric symptoms, but complained of shortness of breath and of swelling of the right arm and right side of the neck. Later some gastric pain developed. The autopsy revealed an extensively ulcerated carcinoma of the stomach, some adhesive peritonitis, and thrombosis of the right innominate, right internal jugular and right subclavian veins.

The second case was reported by Gough (*Bull., Society Anat.*, 1894, No. 13) in 1894. A very complete clinical record, with a thorough discussion of the ante-mortem diagnosis, is given. The essential symptoms consisted of generalised phlebitis of eight months' duration symptomatic of a cancer latent up to autopsy. Practically every superficial vein in the body was thrombosed, and both superior and inferior venae cavae were involved. The possibility of malignant disease was discussed at length, but no symptoms or signs of it could be detected. A non-ulcerated cancer of the lesser curvature was found at the post-mortem examination.

The third case was reported in 1900 by Osler and Macrae ("Latent Cancer of Stomach," *Phil. Med. Journ.*, 1900) in an article in which the different varieties of symptoms presented by cases of latent cancer of the stomach are discussed. In this case also there were multiple thrombi of superficial cutaneous veins; with profound and progressive anæmia; and without gastric symptoms. The autopsy showed cancer of the pylorus and lesser curvature and some metastasis in the liver and mediastinal glands.

As far as I am aware no case has since been reported until the one I now put on record.

My own second case belongs to a different category and only requires a brief report. In contrast to the first case, it is an example of the type in which the thrombosis occurred as a late almost terminal phenomenon.

R—— Y——, aged 42, came into my study in September, 1920, complaining of pain in the stomach, of vomiting, and of

loss of weight. He told me that he had just undergone a course of vaccine treatment for gastric ulcer for three months in a nursing home, but that this treatment, although he was told it had cured his ulcer, had not led to any improvement in his symptoms. Examination at once revealed obvious visible gastric peristalsis; later examination showed the presence of abundant hydrochloric acid, and a bismuth meal showed very pronounced gastric stasis. At my request, Mr. Stoney operated a few days later; a tight pyloric stricture was found, and a gastro-enterostomy was performed. Almost immediate improvement set in. By Christmas time the patient had gained two and a-half stone in weight, could eat anything, and felt perfectly well. Towards the end of January he went away for a short holiday, and while away he thought he got a chill. At any rate, from that date he was not so well, began again to have pain in the stomach, lost weight rapidly, had some return of vomiting, and early in April got severe pain and swelling in the right leg. In consequence of this last-mentioned symptom I was asked again to see him. I found him much emaciated, and with a large painful swelling in the epigastrium; the vomited matter now contained no hydrochloric acid; and the swelling of the right leg was due to thrombosis of the femoral and saphenous veins. During the remaining six weeks of this patient's life practically every vein in the body became in turn thrombosed.

Apart from the thrombosis, with which I am more immediately concerned at present, this case interested me as being the third within a year in which cancer had become engrafted on an almost certain pyloric ulcer after the performance of a gastro-enterostomy. The abundance of hydrochloric acid at the first examination, and the fact that the pylorus was found to be small and fibrosed, strongly suggests at any rate that we were only dealing with a simple ulcer at the first examination. The experience is a point in favour of the view expressed by some surgeons that in all such cases, if at all possible, the ulcerated area should be removed.

The other two cases require only the briefest comment. One illustrates the value of peripheral thrombosis as an early sign of carcinoma. A lady, aged about 50, was seen by Dr. Webb early in October, 1920. She then complained of



dyspepsia and of an irritable cough. The cough was believed to be pharyngeal in origin, a view concurred in by a throat surgeon who also saw the case. Nothing special was found on examination, and the dyspepsia apparently cleared up in the course of a few days. On October 23rd the patient again presented herself, complaining of sudden swelling of the neck. Thrombosis of the left subclavian and left axillary vein was found, and the chest was screened, but with negative result. About the middle of November some abdominal swelling developed, and a vaginal examination at this date showed the presence of a pelvic growth. Later there was some sciatic pain, and in consequence of this I saw her on November 22nd. On examination I found nothing further than what I have already reported, but we agreed in consultation that the thrombosis referred to might be regarded as settling the diagnosis in favour of the growth being malignant. An exploratory operation a few days later confirmed this view, an inoperable adeno-carcinoma of both ovaries being found.

The fourth and last case is one reported by Dr. Parsons to this club early in last session. Dr. Parsons kindly allowed me to see the case in hospital, and has permitted me to include an account of it in this paper. It was an example of general thrombosis in advanced malignant cachexia. The patient, a man, aged 50, was originally admitted suffering from pain in the abdomen, with some rise of temperature and loss of weight. Examination revealed a mass, which was at first thought to be an enlarged spleen, but which later on became extremely big and irregular in outline, and in fact in every way characteristic of a malignant growth. Wasting and loss of strength were progressive, and then thrombosis of peripheral veins became apparent. Practically every superficial vein in the body, including those of the abdominal wall, became thrombosed. At autopsy Prof. Stokes found a cancer involving pancreas, stomach, colon and liver. There was thrombosis of both femoral veins extending upwards in the inferior vena cava as far as the renal veins. The tumour masses in the liver had involved the tendinous portion of the diaphragm and constricted the aperture of the vena cava, so that it would not admit the passage of the little finger. Other secondary growths were seen in the wall of the vena cava but in no place was actual ulceration into the vein seen.

In reporting these cases from the purely clinical point of view no attempt is made to solve the question as to why thrombosis should occur in cases of malignant disease. It is apparent that cases fall into two categories, namely, early and late. In the later cases cachexia of itself seems an adequate explanation, while in the last case reported we have an example of actual obstruction of a large venous trunk leading to widespread delay in blood flow and subsequent blood coagulation. In the early cases it is, of course, possible that either tumour cells, or organisms, find entry into the blood stream. To prove or disprove such a view is difficult and we seen, therefore, in much the same position as Trousseau, who assumed the existence of a special blood state. Whatever may be the cause, however, it appears of value to again call attention to the importance of the phenomenon as an occasional valuable sign in the early diagnosis of malignant growths.

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# BLOOD SUGARS.\*

BY C. E. BRUNTON,

Physiological Department, T.C.D.

**T**HIS paper attempts to collect the information available concerning a small but important factor in human metabolism—the blood sugars.

Except where otherwise stated, all the facts mentioned will refer to human blood, since experiments on other animals may give divergent results owing to differences in the animals' metabolism. Further, the term "blood" refers to the blood of the general circulation and not to that of the portal system.

The subject will be discussed in four sections :

1. The Quality of the Blood Sugars.
2. Their Sources.
3. Their Fate, and
4. The Quantitative Estimation of Blood Sugar.

## (i) *The Quality of the Blood Sugars.*

The writer has been unable to obtain any original articles on the *quality* of the sugars found in the blood. The standard text-books on Physiology agree that glucose, fructose and galactose may all be found in the circulation, that mannose can be assimilated if administered, and that all these may be utilised in the body.

Starling<sup>1</sup> states that maltose will be assimilated if given slowly by hypodermic injections, while sucrose and lactose—two other common di-hexoses—are excreted unchanged if administered in the same way.

Any ordinary hexose then may be found in the blood, but it remains to be discovered what conditions govern the presence and the amount of each variety.

This is not surprising, since, for their discovery or estimation,

\*Read before the Section of Anatomy and Physiology, Royal Academy of Medicine, February 10, 1922.

large quantities of absolutely fresh blood are required, to which the phenyl hydrazine test may be applied.

The difficulty is aggravated by the fact that both glucose and fructose give the same osazone. Their determination in extracts of a fluid which already contains many optically active substances (amino-acids) present difficulties so great as to dismay the most ardent chemist.

From the observations of de Bruyn<sup>2</sup> on hexose mutation in weak alkali solutions—observations more recently confirmed by the work of Nef—it would appear probable that the three common mono-saccharides in blood are interchangeable in form. Heuberg and Meyer<sup>3</sup> show that rabbits can partially transform mannose to glucose. The same transformation can be produced in fructose or galactose.

One is probably right in saying that hitherto no quantitative estimation has been made of blood sugars separately. The figures given in this paper are the amounts of the blood sugars estimated as glucose.

### (ii) *The Sources of the Blood Sugar.*

The sources of blood sugar may be grouped under three headings :

1. The carbohydrates of the diet after their hydrolysis by the enzymes of the alimentary tract ;
2. The stored carbohydrates of the organism ; and
3. The carbohydrates of nucleo-protein metabolism.

The last-mentioned do not concern us here as they probably only account for a comparatively small proportion of the circulating sugar.

As regards the other sources, there exists normally a balance between the carbohydrate store and supply, excess sugar being removed either by polysaccharide formation or by renal excretion, and deficiency being remedied by fresh supplies from the alimentary tract or from the glycogen stores of the organism.

Of special significance in metabolism is the sugar assimilation limit. The arrival of excessive sugar from the alimentary tract causes this limit to be passed and an alimentary glycaemia results. The limit is usually 200-250 gms. of glucose for ordinary

people, though Taylor and Hulton<sup>5</sup> describe five cases in which 500 gms. were administered and only in one case did glycuressis occur. No doubt the rate of sugar fixation of the organism is the important factor in the problem though the renal threshold level is also involved. In the case of higher saccharides, such as starch, there appears to be no assimilation limit for most people; the relatively slow hydrolysis giving the tissues sufficient time to fix the sugars.

Before passing from this section we may refer to the unsolved problem of sugar storage as polysaccharide. Four questions remain uncertain:

1. Whether the liver alone can form polysaccharide, or whether muscles have a similar power;
2. Assuming that polysaccharide formation only occurs in the liver, how does it reach the other tissues?
3. Whether polysaccharide is hydrolysed to sugar in the liver, in the circulating blood, in the muscles, or in more than one of these tissues; and
4. What factors govern the interaction between polysaccharide formation and breakdown.

(iii) *The Fate of Blood Sugar.*

If we assume that the muscles have power to form polysaccharide then part of the blood sugar is removed in that way, and the blood sugar disappears in three ways:

1. By storage as polysaccharide;
2. By direct use as a source of energy, either (a) in the muscles; (b) in the formation of proteins; or (c) in the oxidation of fats; and
3. By excretion through the kidneys.

As a rule the kidney excretion is very slight; but, as is well known, the kidney threshold may be so lowered that, in the absence of hyperglycæmia, glucose appears in the urine.

Normally sugar begins to appear in the urine when its concentration in the blood reaches 0.15 to 0.16%. A patient under the writer's observation was excreting several ounces of sugar daily, yet her blood sugar estimated by MacLean's method was only 0.16%.

(iv) *The Quantitative Estimation of Blood Sugar.*

The following figures are typical of the amounts given :

Osler and McCrea : <i>Principles and Practice of</i>				
<i>Medicine</i>	...	...	...	0.06—0.11%
Starling : <i>Principles of Human Physiology</i>				0.1 —0.15%
Hawk : <i>Practical Physiological Chemistry—</i>				
Normal Blood	...	...	...	0.08—0.12%
Uræmia	...	...	...	0.10—0.2%
Early Diabetes	...	...	...	0.14—0.3%
Late Diabetes	...	...	...	0.3 —1.2%

MacLean <sup>5</sup> gives results varying from 0.096 to 0.110% in venous blood, and 0.112 to 0.127% in capillary blood from the finger whose glucose content might be expected to be higher. The present writer found 0.89—1.15% in normal blood.

The concentration of sugar in the corpuscles is usually a little lower than that in the plasma according to Wishart <sup>6</sup>, and a little higher according to De Wesselow <sup>7</sup>, using MacLean's method of estimation. The difference however is slight.

In normal individuals the blood sugar value rises to about 0.15% one hour after a meal and returns to normal after two hours. Pathological metabolic conditions greatly alter this curve. In hyperthyroidism, pancreatic diabetes and nephritis the return to normal may be greatly delayed. Such conditions will tend to be accompanied by glycauresis in proportion to their severity and to a low renal threshold for sugar.

The small concentrations of sugar in blood reflect the difficulty of estimating accurately its amount. Any methods must satisfy the following requirements :

1. Sufficient quantities of blood must be obtainable without injury to the patient. This necessitates the careful use of a delicate micro-method.
2. The result must not be vitiated by interfering substances. Thus polarisation methods cannot be applied, acetone will interfere with reduction tests <sup>8</sup> and protein emulsoids, unless removed, both increase the amount of sugar found by reduction



tests and render opaque the liquid which is to be analysed. The thorough removal of protein is necessary.

3. Glycolysis which occurs rapidly during the first three hours after the blood is drawn must be prevented. In one sample of diabetic blood which the writer divided into three parts the amount of sugar found was as follows : 0·26% and 0·27% where glycolysis was prevented, but 0·197% where glycolysis proceeded for about two hours.
4. Finally, re-oxidation must be prevented in reduction methods.

Among the methods for estimating blood sugar Benedict's method <sup>9</sup>, or its modification by Epstein <sup>10</sup>, are those most generally used. In the former, 2 c.c.'s of blood are laked. The proteins are precipitated with picric acid and removed by filtration. The filtrate is treated with standard sodium carbonate solution. After incubation the colour produced is compared with a standard. In Epstein's modification, which has much to recommend it, only 0·2 c.c.'s of blood are used. Unfortunately no results are given in the article quoted to show the consistency of the method. After seeing the effects produced by altering the time of heating in reduction experiments, the present writer is disinclined to adopt for research a method in which a few cubic centimetres of fluid are "concentrated to a small volume equal to about two or three drops."

Criticisms levelled at Benedict's method affect the Epstein modification. We have referred to the effect of acetone in the blood. More important is the fact that, as shown by De Wesselow <sup>7</sup>, interfering substances which are concentrated in the blood corpuscles rendered results on five samples of blood from 28% to 41% higher when estimated by Benedict's method than when estimated by that of MacLean. De Wesselow discusses the results and shows conclusively that the results obtained by Benedict's method are too high.

#### *MacLean's Method.*

Under these circumstances, and because the original descrip-

tion of the method <sup>5</sup> is now out of print, MacLean's method ought perhaps to be described. The steps are as follows :

1. 0·2 c.c.'s of blood are measured by a special pipette applied to a prick in the cleansed finger-tip.

2. The blood is deproteinised by heating in an acidified 15% sodium sulphate solution, after which dialysed iron is added to complete the precipitation. The heating also prevents subsequent glycolysis.

3. After cooling, the mixture is filtered and a perfectly clear protein-free filtrate is obtained.

4. An aliquot part of the filtrate is boiled with an alkaline copper solution containing potassium iodide and iodate. The boiling is carried out for six minutes over a standard flame in a flask which has a capillary tube passing through its cork.

5. After boiling, the solution (which contains suspended cuprous oxide in proportion to the sugar present) is rapidly cooled and is treated with a slight excess of hydrochloric acid.

The acid interacts with the iodate and iodide liberating iodine to the known amount of the iodate in the solution. At the same time any cuprous oxide is dissolved and cuprous chloride is formed. A solution of cuprous chloride is very instable, but oxidation is prevented by the free iodine present with which the chloride immediately reacts, thus reducing the amount of free iodine in proportion to the amount of copper which the sugar reduced.

Since the cuprous oxide present at an earlier stage is in suspension, no re-oxidation occurs during the cooling before the hydrochloric acid is added : while still earlier during the boiling there is no air in the flask, and at the beginning of heating air is driven off before the reduced copper can be oxidised to any extent.

6. The solution to which the acid has been added is a perfectly clear one and the free iodine in it is titrated against N/400 thiosulphate, using two drops of a 1% starch solution as indicator. The end point can be read without difficulty to within 0·04 c.c.'s of thiosulphate.

7. A blank thiosulphate value having been obtained for the copper solution, the difference of thiosulphate used is noted and the results are read off from the tables, the difference being due to the amount of iodine absorbed by the cuprous chloride formed from the cuprous oxide.

MacLean's method undoubtedly requires the use of fresh thiosulphate solution—which should be made up once or twice a week from stock N/10 solution carefully prepared. In working with the method one finds that MacLean's system of obtaining the thiosulphate value of the copper solution without heating it does not give quite the same result as if it is boiled for the six minutes. The writer, too, prefers a reflux

condensor on the boiling flask to the capillary tube. But these are minor points, and the method successfully overcomes the difficulties of working with a small quantity of blood, of de-proteinising, of preventing both glycolysis and re-oxidation and of obtaining a very delicate end-point. No interfering substances have so far been discovered. The method gives very consistent results. MacLean quotes the following figures for three samples of blood :

	1st sample.	2nd sample.	3rd sample.
1st Estimation ...	0·112%	0·127%	0·114%
2nd       ,,       ...	0·116%	0·126%	0·119%

In working with the method the writer has obtained the following results :

1. Estimation of a glucose solution prepared from Kahlbaum's specially prepared pure glucose, dried and weighed after being powdered :

1st estimation ...	...	...	...	0·107%
2nd       ,,       ...	...	...	...	0·101%
Calculated strength	...	...	...	0·100%

2. Blood sugar in healthy male adult :

12.0 noon	...	...	...	0·110%
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After a light mixed lunch at 1 p.m. :

2.30 p.m.	...	...	...	0·115%
4.0 p.m.	...	...	...	0·104%

showing a rapid disappearance of sugar excess from the blood.

3. Case of glycuresis mentioned ... 0·160%

4. Case of true diabetes, 1st estimation ... 0·26%

2nd       ,,       ... 0·27%

5. At the suggestion of Dr. Fearon that saliva might be a channel for the excretion of sugar in diabetes, samples of saliva were examined :

Saliva, healthy male	...	...	0·036%
Saliva, alleged diabetic without hyperglycæmia	...	...	0·040%
Saliva, true diabetic	...	...	0·043%

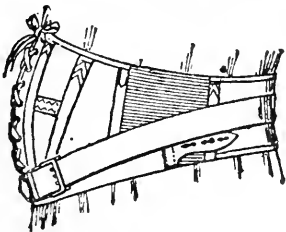
In conclusion it may be said that, from the point of view of further research, MacLean's method for blood sugar estimation,

by its superior accuracy combined with its comparative simplicity, promises to be a valuable aid in solving the problems of abnormal carbohydrate metabolism.

The writer wishes to express his thanks both to Prof. Pringle for permission to carry out this work in the Physiologica. Department, Trinity College, Dublin, and to Dr. Fearon for his generous assistance in many difficulties.

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# THE PROGNOSIS IN MENTAL DISEASE.\*

BY H. R. C. RUTHERFORD.

MR. PRESIDENT, LADIES AND GENTLEMEN,—I feel that some explanation is needed for attempting to address you upon such a subject as the title of this paper conveys, but the paucity of information concerning the matter to be found in modern text-books on mental disease, and, at the same time, the rarity with which psychiatry finds a place in your discussions, have led me to hope that it will not be unwelcome.

In the process of selecting a portion of mental disease that might be of interest to you, it struck me that the most common difficulty met with in practice is connected with the question of prognosis.

Every mental attack that occurs in a family must mean a great deal of anguish to the relatives concerned, and this pain becomes all the more marked if the unfortunate experience should be the first of its kind that has occurred in the particular family affected—for then the illness is liable to appear as something inexplicable and, therefore, of a nature that should be hidden from the eyes of the world. In the midst of the bewilderment that arises, the question that almost invariably comes is : “ Will he get well, Doctor ? ”

Now, for several reasons, the correct prognosis of a mental attack is a very difficult matter. In the first place, one must exclude the valuable information supplied by the patient himself in almost every other form of illness. Secondly, there is a sort of inherent aptitude possessed by the public of overlooking small mental defects in their relatives, the history of which might mean so much in arriving at a true understanding of what the outcome of the mental disturbance may be.

These two facts taken together have made the path of the

Read before the Section of Medicine, Royal Academy of Medicine  
March 3rd, 1922.

mental physician to abound with difficulties. Indeed, so much is this the case, that the physical examination of the insane has occasioned its comparison to that performed by a veterinary surgeon without, however, having the advantage of knowing his methods.

Another point that influenced the selection of the subject is the type of information that can be gleaned concerning it from the many statistics laboriously compiled by the medical staffs of the public asylums. In these, it is true, one can find the percentage rate of recoveries, the length of residence of each recovered patient in the institution concerned, the age of the patient, and the amount of time he was ill prior to certification.

There are, however, a couple of items omitted which, to me, would appear to be of the highest importance. One is the influence of heredity in recovery; the other, the clinical nature of the illness in the recovered patients.

Before entering into these details it will be of advantage to lay before you the general results in the treatment of mental disease as a whole. These vary so greatly that, taken unexplained, they can only lead to confusion. For instance, de Fursac<sup>1</sup> and Rosanoff quote a State report, dated 1834, which contains the following passage: "It is now satisfactorily established that diseases of the mind yield even more readily to medical treatment than those of the body, and that, in at least nine-tenths of the cases of insanity, the patient may be restored to the full enjoyment of his mental faculties by the early application of judicious medical treatment." The same authors quote a summary of Kræpelin's in these words: "Only a comparatively small percentage of cases are permanently and completely cured in the strictest sense of the word." The word 'permanently' accounts for the discrepancy between these two statements, in so much as there cannot be any question about the tendency of mental disease to recur, the reason for which I hope to explain later.

The recovery rate is, as a rule, estimated upon the number of admissions, and, during the year 1919, 1,347 patients were discharged from the public asylums of Ireland, which result gave a recovery rate of 37·8 per cent. In the same period 389 recoveries were registered from the various private



hospitals, which gave a percentage of 37 per cent.—almost identical figures to those given by the public asylums.

During the past five years the recoveries at St. Patrick's Hospital have given an average recovery rate of 50·98 per cent., made up of 48·38 per cent. in the case of men and 53·15 per cent. in the case of women. In a somewhat similar hospital in England the results for the same period of years were 43·28 per cent. for the total recoveries, which were made up from recovery rates of 37·97 per cent. in the case of men and 46·79 per cent. in the case of women.

Now these latter statistics refer to direct admissions only—in other words to patients who have not been transferred from other mental hospitals. I have chosen this type as being the more similar to that which prevails with us.

In both sets of figures, there is a greater recoverability amongst women. This is particularly marked in the case of No. 2 hospital, which fact, I suspect, is due to the larger number of male general paralytics treated there. These patients, of course, in the present state of our knowledge, must be regarded as irrecoverable.

Taken as a whole, the two sets of figures will give a recovery rate of 43·17 in the case of men and 49·97 per cent. in the case of women—a total of 47·13 per cent., which figures, I think, may be taken to be amongst the best results that could be obtained in the treatment of mental disease at the time of their computation.

Now, the number of cases out of which the statistics that concern St. Patrick's Hospital are produced cover exactly 157, and in these patients I have made a further investigation dealing with the following points: length of treatment, the clinical features of the illness, the periodicity of the attack, and the association of an insane heredity. By this means I hoped that we might be able to obtain a fair idea of the make-up that constitutes the recoverable type.

### *The Influence of Age.*

In connection with this I propose to take certain information that is available in the annual statistics published by the Irish Inspectors. One of these deals with the age of the patient and answers the question as to the age-periods at which the

best chances of recovery occur. In these statistics 1,347 recoveries are involved, and, if we take the percentage of these recoveries as estimated upon the similar age-periods at admission, we find that by a considerable margin the most recoverable age-period is from 15 to 19 years of age. Next comes the 20 to 24 year period, followed by the children included in the ages 10 to 14. The most remarkable fact, however, in the whole result is the place occupied by the ages 25 to 34 years. This is the least recoverable of any age-period up to 64 years. What accounts for this result ? I think dementia præcox does, for it is most liable to appear within this period.

So, on the whole, extreme youth is the most favourable time for recovery to take place, but it must be remembered that attacks in early youth signify an insane heredity, and the influence of this fact must be remembered.

For a really good prognosis, however, I should prefer the ages 48 to 57, for during these years what are known as the single-attack or accidental insanities are liable to occur. When recovery takes place, a recurrence does not, as a rule, happen. They usually have a definite and ascertainable cause for their illness and, upon removal of this cause, a good recovery ensues.

### *The Duration of the Illness.*

With regard to the duration of the disease, of the above 1,347 recoveries, 715 had been admitted within three months from the beginning of the illness. 761 were discharged within six months after admission. Another six months added 306 to the number, so that 1,067 out of 1,347, were discharged during the year. Another 127 recovered during the second year, and the remaining 153 were spread over a series of years. In my experience, the average acute case gets well in about four and a-half months. Depressed patients continue ill for much longer than the excited. Indeed recovery has been known to take place in the depressed after many years of suffering. These people are liable to be kept at home for considerable periods before being sent to hospital, and this can only be done in every case at the risk of suicide.

*The Clinical Features of the Disease.*

In order to get the picture of certain common states of mental disease without placing them in their exact classification, I have taken four divisions: (1) Excitement, (2) Depression, (3) Confusion, (4) Delusional states.

It is almost impossible for the busy physician to keep pace with the various classification of mental disease. At the present moment the influence of Kræpelin<sup>2</sup> is being felt all over the world. He has given us the entity of Dementia Præcox, following to some extent the secondary dementia of adolescence associated with Clouston. More lately he has detached from this certain cases and placed them in another form known as Paraphrenia, which seems to come midway between Paranoia and Dementia Præcox. Then again there is his conception of Manic-Depressive Insanity.

Freud, Jung and others have flooded the psychological world with terms born of psycho-analytical methods. All these new terms mean greater difficulty for the physician who is not in daily contact with mental disease. These few words will perhaps provide sufficient reason why I have chosen on this occasion to make a simple classification of mental states instead of the more complex entities.】

*States of Depression.*

The majority of recoveries, as might be expected, have occurred amongst cases of depression, 63 out of the 157 come under this heading. It may be said at once that depression is the most recoverable of all mental states. Provided one can keep the patient alive, recovery of mental health will nearly always occur. There may be great difficulty, however, in maintaining the physical condition. Food is often refused for several reasons, which may necessitate tube feeding, and even then the food introduced may have little effect in preventing an emaciation that is dangerous to existence.

There are a few types of depression that one must be careful to exclude when giving a good prognosis. These are associated with Dementia Præcox, General Paralysis, and marked senile changes. The other forms usually recover, provided the patient is guarded from death by natural means or by suicide—which

is an ever-present danger in these cases, and which can only be prevented by a constant observation of the patient.

It is said to be one of the most hereditary forms of mental disease and, for that reason, there is a liability of the attack to recur. When the patient recovers from his attack, even after years of illness, there will not be found any signs of dementia as a rule. The immobile existence led by many of these chronic patients is, however, liable to leave marks upon the physical side of the individual. Involutional melancholia, which by some is regarded as a separate entity, comes on later in life than the depression associated with manic depressive insanity which, moreover, is liable to show a greater influence of the hereditary factor as a causation.

Sir Frederick Mott <sup>3</sup> has shown that the first attack of mental disease in insane offspring from insane parents occurs before the age of 25 years in 50 per cent. of the cases, and that the tendency is for insane offspring to have their attacks at an earlier age than was the experience of insane relatives in preceding generations. He thus sustained Darwin's theory of Anticipation, and demonstrated nature's method of ending an unsound stock.

Further, the onset in involutional melancholia is of an insidious nature, and the attack may be very prolonged. About 25 per cent. of these patients die, but should recovery take place, recurrence is not a probability. The prognosis is largely governed by the physical state of the patient's health, as many of these patients are advanced in age, but age in itself does not appear to debar recovery.

Improvement in the physical symptoms of the disease without evidence of a corresponding change in the mental state is of bad prognostic significance. The development of auditory hallucinations is another grave sign.

#### *States of Excitement.*

Excitement was the next most common state, accounting as it did for 56 out of the 157 patients.

As a general rule, acute excitement is favourable from an immediately recoverable point of view, and the more acute is the excitement the shorter will be the attack. A few weeks may suffice for the quietening down of the acute symptoms,

but the remaining trouble will probably continue for anything from four to eight months though, indeed, some cases last much longer and yet recover. Those who do not attain this result will probably be associated with *Dementia Præcox*, *General Paralysis*, or *Epilepsy*, but there is a well-formed division of chronic excitement, which does not conform to any of these types, and which continues to be called *Chronic Mania*, though it is much more rare than it was thought to be.

In all cases of acute excitement one must be careful to exclude the possibility of it being the precursor of acute delusional insanity. This disease is very liable to end fatally within a period of anything from a few days to as many weeks. The temperature is a good guide, as this entity almost invariably runs a temperature of from  $101^{\circ}$  to  $103^{\circ}$ . Sordes form on the lips, the tongue is dry, and there is marked constipation. Food is refused, and, unless an intensive form of feeding is resorted to, the patient rapidly passes into coma and death. This result occurs, even when the patient is given the greatest care, in about 25 per cent. of the cases, but this percentage may mount much higher.

The tendency is for the ordinary form of excitement to recur at some future date, and frequently there is an association with depression, so that these two conditions have come to be regarded in many cases as being merely separate manifestations of the same disease, which is called *manic-depressive insanity*. The forms of excitement in connection with this may be either intermittent or periodic. The intermittent form which is the more common is liable to terminate in dementia after five or six acute attacks. Periodic insanity, upon the other hand, rarely ends in this condition. Diagnostic points in favour of the latter are marked similarity of the attacks and an almost exact duration of time between their occurrence.

*Manic-depressive insanity* is largely self-recoverable if the patients be given sufficient care and time, but during the illness an immense amount of anguish, destruction and loss of physical condition take place, to say nothing of the potential mental marks that may remain.

These attacks can certainly be curtailed in severity of symptoms and duration by appropriate treatment in the early

stages. In many cases it is possible to arrest the attack. Some of the excited respond in a surprising fashion. The depressed type takes longer as a rule to show benefit, but in hospital life one is liable to see depressed people at a later stage than is experienced with the excited, which may account for some of the difference, but I think that in cases of depression an additional cause is at work, which cause is more difficult to eradicate.

Should treatment prove unsatisfactory, it is probable that one is dealing with an example of dementia præcox, a further step in mental degeneracy.

Stereotyped movements, attitudes and forms of speech, combined with marked indifference, negativism and defects of judgment, may be of help in the differential diagnosis. Hallucinations, if persistent, are also unfavourable, and in association with multiple stigmata of degeneration will point towards the same disease.

#### *States of Delusion.*

Quiet states of a delusional type were the most marked features in 23 of our total. The majority of delusional conditions, when they occur distinct from excitement or depression, may be said to be unfavourable. Especially is this the case if these delusions tend towards any form of systematisation. Should this be a factor in the illness, chronic delusional insanity may be suspected. If hallucinations are an accompanying symptom, the condition may be due to Paraphrenia, which also justifies a bad prognosis. Delusions are excessively common in all forms of mental disease, so that, apart from the systematised type—in which suspicion and persecution are prominent—and the exalted variety, there is not very much prognostic value to be laid upon them. Well-marked exaltation may be helpful in the diagnosis of General Paralysis, but it also occurs in the alcoholic psychosis, epileptic insanity, dementia præcox and during periods of the manic-depressive psychosis. It has been said that when exaltation appears in the illness of an aged patient it is an ominous sign—indicative of a rapid dissolution. Delusions of jealousy and infidelity are grave conditions which have frequently been the cause of homicide. Kræpelin has laid emphasis upon the diagnostic

importance of delusions of influence upon the body and thought, and regards them as being indicative of dementia præcox.

*States of Confusion.*

These were the least common among our recoveries. They accounted for only 15 patients. This fact must not be taken as evidence of poor recoverability of that class of patient, but instead it points to the rarity of the illness in a mental hospital as compared with the other states of mental disease. The condition may appear in the guise of excitement or stupor, and in the case of the former, it becomes necessary to differentiate the true confusional insanity, which is of a good permanent prognosis, from manic-depressive insanity, in which a good prognosis can only be given for a limited period. In stuporose cases the catatonic form of dementia præcox may be simulated.

Confusional insanity usually follows a well-recognised physical cause. It is an exhaustion psychosis, liable to follow any of the infective fevers and great mental or physical strain. In addition to the history of such an illness, there will be found the characteristic symptom of disorientation. Further, there is an absence of that elation so common in the manic-depressive psychosis. Sometimes the mental illness starts without any prodromal physical disturbance, but in the course of the disease, however, it will become obvious that some toxic cause is at work.

The prognosis is very good, provided one can ascertain and terminate the causative factor. Mental recovery usually takes place within three or four months.

My experience of heredity and mental disease is to the effect that in about 50 per cent. of the admissions, an insane inheritance can be ascertained and something like another 20 per cent. may be regarded as suspicious. Contrary to popular opinion, an insane heredity does not necessarily mean that the patient cannot recover from his immediate symptoms, and, in support of this, I draw attention to the fact that 52 per cent. of the patients now being considered, and who recovered, gave a history of familial mental trouble. This inheritance will, however, distinctly favour a recurrence of the illness.

Mott has pointed out that mental affections tend to take on a more gross form with each succeeding generation, but that a neuropathic inheritance seldom lasts more than a few generations. In other words, the first generation of mental disease may be of the manic-depressive type, the second generation may demonstrate dementia præcox among its members, and the third may end in imbecility. This may mean the extinction of the family. Upon the other hand, there is the tendency of a neuropathic inheritance to deviate towards the average type, which tendency is known as the law of filial regression. In this way the inheritance may also disappear.

Now about one quarter of the admissions to public asylums are of the recurrent type and, as I have pointed out, these recurrent cases show a high average of insane inheritance.

If these recurrent attacks could be prevented, what an enormous advantage it would mean to the country in its finance alone.

In 1919 the total expenditure on public asylums in Ireland was £1,200,000. of which only £26,000 were met by patients paying for their maintenance. No doubt the latter figures are now greatly increased.

At this point I should like to express a personal belief, and it is to the effect that a fair amount of mental disease is preventable by treating patients on the basis of their heredity. Further, I believe this heredity in mental disease is a physical defect, which defect is of a hypo-thyroidal nature.

In the course of many years experience in thyroid medication I have been frequently struck by the remarkable manner in which some patients with an apparently hopeless family history have responded to the treatment.

During the past couple of months, on investigating this point, it occurred to me that the most successful cases had shown a history of collateral heredity, in other words, that the relatives affected were of the same generation as my patients.

Again, it became noticeable that the patients who responded best were mostly of the manic-depressive kind, and that in dementia præcox a more gross form of mental disease—and one likely to show an insane inheritance from the preceding



generation—the response, though often present, was, as a general rule, small and temporary in character. Upon going into the question of the pathological findings in the latter disease, it became evident that whereas each of the originators laid stress upon his own hypothesis concerning the cause of the disease, yet they all emphasised the importance of something inherent in the affected tissues.

For instance, Mott <sup>4</sup> states that the disease is due to degenerative changes which take place in the sex organs. Ford-Robertson <sup>5</sup> holds that it is caused by an intestinal infection. Matsumoto <sup>6</sup> believes that a premature decay takes place in the neurones. Now, if one regards for a moment the effect of the thyroid upon the growth of the body, these various degenerations, occurring at a time when a strain is upon the organs in which they occur, seem explicable by a thyroid deficiency which, though not sufficient to prevent their development, has yet endowed them with a poor durability, so that, should the strain be severe, the organ involved must degenerate. This will account for the want of success in treating these cases with thyroid once the disease is established. There are several more arguments that can be advanced in favour of this hypothesis, but as this paper concerns prognosis in mental disease, I merely mention the point here, as it seems to me that an intensive investigation of hypo-thyroidism will produce a great advance in both the prevention and treatment of mental disease.

In my opinion, hypo-thyroidism is not the total cause of even the less gross types of mental disease. There is always a something else, but in some cases, if one removes this hereditary factor, the exciting cause seems to disappear. In the more degenerate types this disappearance does not occur except for a very brief interval.

On going through the family history of the insane, one cannot fail to notice the frequency with which certain forms of illness occur among members of these families. Some of these diseases are said to have a relationship to heredity. A family history of tuberculosis, for instance, sometimes seems to replace the expected history of mental disease. Another disease frequently associated with the insane is asthma.

Iodine in the form of potassium iodide, or through some

other preparation, is often prescribed in these conditions. It is said that one of the functions of thyroid concerns the control of the iodine content of the body. Further, it is believed that potassium iodide produces some of its manifold actions by stimulating the thyroid to increased production of its secretion.

The other disease that seems unusually common among the families of the insane is cancer. The history of it occurs here and there in psycho-pathic families with surprising regularity.

In this connection, I noticed a letter in the *British Medical Journal* of last week concerning the research work done at King's College, London. The writer stated that the blood serum of mice recovered from cancer showed that natural chemical processes were at work, and that similar reactions held good in recovered tuberculous and other bacterial diseases examined.

May it not be possible that these investigators are demonstrating the hereditary defect in both cancer and tuberculosis ?

Whether this serum reaction can be of a hypo-thyroidal nature I cannot say, but to me there seems sufficient clinical association between these two diseases and insanity to justify more than a suspicion that hypo-thyroidism may act towards them in the same capacity as I believe it to influence mental disease, that is, as an hereditary factor which predisposes the inheritor thereof to suffer from them, but, that in each disease a distinct and separate exciting cause is at work, which exciting cause will decide the nature of the illness that will ensue.

In conclusion, I must apologise for having deviated somewhat from the title of my paper, but the extraneous matter is so interwoven with my subject that I venture, with all humility, to lay that association before you, who are dealing daily with these dread diseases.

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4. Mott : *Journal of Mental Science*, July, 1921.
5. Ford-Robertson : *Journal of Mental Science*, January, 1922.
6. Matsumoto : *Journal of Mental Science*, October, 1920.



DR. JUNIOR: "Now, Doctor—look at this dressing, just removed from my patient's neck—or, rather, from his carbuncle."

DR. SENIOR: "Well what is the matter with it?"

DR. JUNIOR: "Why, nothing—only that every Antiphlogistine dressing, removed some hours after its application, shows a moist center, while the periphery of the application which covered the normal surrounding tissues—is always dry. Now, I presume that is sweat——"

DR. SENIOR: "Oh, no, Doctor. If that were the case, the entire under surface of the poultice would be wet, since the heat of the poultice is uniform, you know."

DR. JUNIOR: "Well, then—what is the explanation of the phenomenon?"

DR. SENIOR: "I'm glad you brought that up. That moist center shows where the exudate has been taken from the congested tissues, and is demonstrative proof of the osmotic action of Antiphlogistine, my boy."

DR. JUNIOR: "Well, now— that is something to know—!"

DR. SENIOR: "And furthermore, I have come to consider this 'selective' action of Antiphlogistine, as almost Diagnostic of inflammatory process below the surface where the poultice has been applied."

DR. JUNIOR: "In other words, then, Antiphlogistine, in inflammatory conditions, has a diagnostic as well as remedial value. Odd, isn't it?"

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## BOOKS.

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### THIS MONTH'S SPECIAL REVIEWS.

*Studies in Influenza and its Pulmonary Complications.* By D. BARTY KING, O.B.E., M.D. (Edin.), M.R.C.P. (Lond. and Edin.), Physician to the Royal Chest Hospital, London. London : J. and A. Churchill. 1922.

THIS monograph consists of a record of three studies in influenza, made by the author, at the County of London War Hospital, during the war.

The first study deals with influenza as observed in patients also suffering from malaria. The difficulties of diagnosis in such cases are referred to, and the value of quinine in helping towards a conclusion is specially insisted on. In dealing with treatment, the writer insists that morphia given for insomnia in acute pneumonia is extremely dangerous. With this statement we are not altogether in agreement. Undoubtedly severe toxic cases with nephritis should not be given morphia, but the reviewer's experience during the epidemic convinced him that, provided judgment was used, no hypnotic was safer or more satisfactory than morphia. This article should prove of great value to all whose work lies in districts where malaria is prevalent.

The second study deals with the after effects of the acute pulmonary complications of influenza, and is valuable from a statistical and diagnostic point of view. We are quite in agreement with the opinion which is strongly expressed, namely, that early breathing exercises are of special value in preventing contraction of the lung, following acute pneumonic conditions.

The last study deals with influenza as observed in the nurses at the hospital. It contains many observations of interest and importance in relation to incubation period, symptoms and mortality rate.

*Influenza: An Epidemiologic Study.* By WARREN T. VAUGHAN, M.D. ("The American Journal of Hygiene," Monographic Series No. 1. 1921). Baltimore, MD.

THIS is an elaborate and very valuable study on the epidemiology of influenza. The author, in his preface, tells us that, having had occasion to review the literature of the last pandemic, it became quite apparent that many of the writers were very largely uninformed regarding the experiences accumulated during the 1889 epidemic. He therefore set himself to the task of correlating the epidemiologic observations of the two epidemics referred to, in order that when future inroads of the disease occur, there might be available in readily accessible form, the analysed and accumulated experiences in different parts of the world at different epochs. The study is too detailed and elaborate for any analysis in a short review. It deals briefly with our historic knowledge of influenza, with the symptoms in the present and in former epidemics, and with the manner of spread, both in individual localities and generally throughout the world.

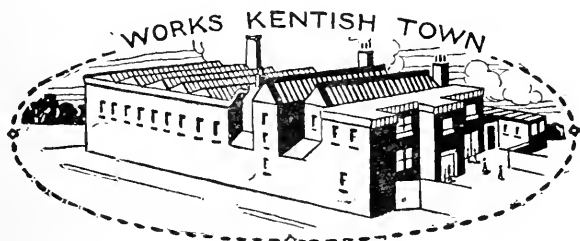
Other subjects discussed are the relationship of influenza to other diseases, the comparison of influenza with other epidemic diseases, and the prevention and control of influenza. There is also a special chapter on influenza in Boston in 1920.

We do not think it likely that the ordinary medical practitioner will read this book, but at the same time we believe that it will prove of immense value to students of the disease, both at present and in the future. It should be, in fact, a definite landmark from which many future studies may start.

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# ABSTRACTS OF CURRENT LITERATURE.

## SURGERY.

MOORHEAD (New York): *Fracture of Femur*. Med. Record. Feb. 11, 1922, p. 260.

IN presenting a report on 50 unselected cases treated by him, M makes an attempt to standardise such fractures into one of two groups, either of which might be simple or compound. Group I. contained those in which there was malalignment, with marked separation or overlapping of fragments; in Group II. were placed those whose fragments were in good line, and had no overlapping. Good results in fractures should be grouped under the three headings: Function, Union and Contour, of which Function is allotted 60%, Union 20%, and Contour 20%, thus realising that function is three times more valuable than the other elements. His analysis showed the great value of transfixion-extension in shaft fractures; in these the nail remained *in situ* 29.6 days on an average; this indicated that by the transfixion method union becomes firm enough at the end of a little over four weeks to apply walking callipers; by other forms of treatment in which skeletal traction is not employed, union is rarely firm until the end of twelve weeks. Doubtless the increased self massage, circulatory activity, freedom from atrophy, lack of œdema, slight motion between the fragments and joint activity, all incidental to skeletal traction, contributed to this early bony repair. His experience would indicate that the treatment of fracture of the femur resolves itself into the following: (a) Children up to five years to be treated by overhead suspension; (b) Fractures of the neck to be treated by an abduction plaster of Paris cast, physique permitting; (c) Fractures of the shaft to be treated by one of the forms of skeletal traction, of which the Steinmann transfixion pin was the choice.

WM. DOOLIN.

SKILLERN (Philadelphia): *Choice of Operation in Inguinal Hernia*. Surg. Gyn. Obst. Feb., 1922, pp. 230-237.

THE type of sac encountered is the determining factor as to whether the posterior wall of the inguinal canal need be reconstructed or not. Long, narrow, thin, non-adherent sacs, representing an unobliterated processus vaginalis, if met with in childhood, adolescence, or as recent herniæ in muscular adults, simply require high ligation of the sac, without reconstruction of the abdominal wall. The sessile sacs, such as are met with in direct herniæ, does not require ligation; they should

be invaginated, and a careful reconstruction of the defective posterior inguinal wall carried out. In indirect herniæ of long standing, the canal musculature has been overstretched and weakened by the long-continued drag of the sac and its contents: here, too, a reconstruction is essential.

The important features of the operation as carried out by the author are as follows:

1. Free exposure and thorough cleaning of Poupart's ligament, Gimbernat's ligament, the triangular fascia, the pubic head of the rectus and *linea semilunaris*, with its lateral aponeurosis.
2. Firm reconstruction obtained by developing a fingerlike cylinder of the musculo-aponeurotic tissue within and above the thinned out conjoint tendon and internal oblique, suturing this cylinder to Gimbernat's and Poupart's ligaments from the pubic bone to beyond the internal ring.
3. Fastening the lower flap of external oblique down upon this cylinder, and overlapping the upper flap of external oblique down upon the lower.
4. The cord is placed on the outer surface of the imbricated external oblique aponeurosis.
5. The deep layers of the superficial fatty tissue are sutured over the cord.
6. Lyle's flexion posture is recommended, both during operation and throughout the early convalescence.

WM. DOOLIN.

WRIGHT (London): *Surgical Pathology of Hypernephroma*. "Brit. Journ. Surg." Jan., 1922, pp. 338-365.

ALTHOUGH forming 65% of all renal tumours, this is not by any means a common neoplasm. Statistics show that 95% of hypernephromata occur after the 40th year, the average age of incidence being 55 years.

The usual initial symptom is hæmaturia of the "smoky" type, not profuse, and due to an associated chronic interstitial nephritis. Profuse hæmorrhage, with clots and colic, is due to invasion of pelvis by the growth, is commoner in the later stages, and is of grave prognosis. Pain is the second symptom: it may present as (a) renal ache, from pelvis distension; (b) renal colic, from passage of clots; or (c) acute lumbar pain, due to hæmorrhage into the growths. A palpable tumour forms the third sign. Less frequently we find frequency, dysuria, or actual retention. Cystoscopy shows a clean bladder, with blood coming from the ureter of the affected kidney. A Roentgen plate may show an enlarged kidney shadow, even when no renal tumour is palpable.

The operative prognosis is not very encouraging. Their great vascularity and tendency to invade the renal vein make dissemination of the blood stream a frequent occurrence. Invasion of the renal vein

usually means death within six months of operation. Thorough removal of perirenal fat, the author hopes, may diminish tendency to local recurrence. Usual interval for recurrence is from three to four years.

These tumours may be found anywhere within the renal substance. They are not confined to the upper pole of the kidney. They are more or less surrounded by a false capsule, composed of compressed renal tissue: they are roughly spherical, of varying size, and contain yellow areas of fatty degeneration. The renal capsule is at first stretched; if the tumour grows slowly, the capsule is thickened; if rapidly, it is thinned and pierced, often directly invaded. Invasion and distortion of the pelvis are common. Adherence of the capsule to the perirenal fat does not necessarily signify invasion by tumour growth.

Microscopically, the tumour tissue shows an essentially papillary structure. The cell is large, vacuolated, containing fat, with well-marked mitotic nucleus. The more irregular the nuclear outline, the more malignant the growth. These cells grow out in loops of varying type from a connective tissue stroma; the relation of cells to stroma is constant and characteristic; they may grow in seven or eight layers on the stroma stalk; this essentially papilliferous form is a most important characteristic and was first emphasised by Stoerk.

With Grawitz' hypothesis (1884), that these tumours arise from suprarenal rests, the author cannot agree; amongst the facts which militate against this contention are the following: Hypernephromata are not confined to any one area in the kidney; there is no adrenalin contained in these tumours; unlike true suprarenal tumours, alterations in sex characteristics have never been noticed in hypernephromata; no case of tumour in the suprarenal gland has ever been proved to have a papillary structure.

In opposition to the view of Wilson and Willis (Mayo Clinic, 1910), that hypernephromata arise from Wolffian rests, the author maintains "they have not produced a single such rest, nor have they shown how it is possible for an amorphous mass of tissue like the Wolffian body to produce a tumour foundation essentially papillary in nature."

Sudek (1893) and Stoerk (1908) considered hypernephroma to originate in the renal tubules. With this hypothesis, the author is in full agreement; according to him the tumour is of papillary structure, sometimes adenomatous, and sometimes carcinomatous, but always originating from the renal tubular epithelium.

A detailed description of 19 specimens from the museum of the Cancer Hospital, London, is appended.

WM. DOOLIN.

LOEWY (Paris): *Jejunocolic Fistulæ*. ("Thèse de Doctorat." Paris, 1921.)

A FISTULOUS communication between jejunum and colon may arise during the evolution of a gastro-jejunal or jejunal ulcer. In about

20% of all recorded cases, this ulcer eventually perforates into the colon: the perforation is preceded by a phase of jejunocolic adhesion-formation. Such fistulæ have been observed solely after gastro-enterostomy performed for relief of gastric or duodenal ulcer; they are situated between the efferent jejunal loop and the transverse colon, close to the operative anastomotic opening; the efferent jejunal loop is invariably dilated, congested, and thickened; the colon is narrowed at the fistulous area, dilated behind this, collapsed beyond.

The mode of formation of the jejunal ulcerative process, which has been the starting-point of the fistula, still eludes us. The use of unabsorbable suture material does not fully account for its origin, since the magos continue to find its occurrence even after catgut has been employed. A combination of factors seems necessary, amongst which may be included: the effect of trauma (silk sutures, clamps, technical errors) on the jejunal mucosa, of bacterial invasion, of injury to nerves, of embolic infarcts, of spasm; classifying all these as primary predisposing factors, the action of the acid gastric juice must be added as a likely secondary factor. One remarkable fact is the undoubted predisposing effect of pyloric exclusion on the development of these ulcers; this has been observed, both clinically and experimentally.

Generally speaking, patients with jejunocolic fistula following gastro-enterostomy pass through three phases: at first, a free interval, usually of less than two years' duration, following operation, in which neither subjective nor objective signs of trouble appear; then a fairly long period ensues, commencing with the troubles due to the jejunal ulcer; finally, the period of established fistula-formation. The second period may be missing in some patients' history, and signs of fistula-formation appear suddenly without any evidence of antecedent ulceration. Diarrhœa, fetid eructations, and occasional true fœcal vomiting are the usual characteristic signs of jejunocolic fistula. The course is occasionally remarkably slow. A long duration-period is observed where the fistula is narrow, and producing no marked stenosis of the colon. It is interrupted by intervals of well-being, marked by a cessation of diarrhœa; solid fœcal material cannot pass through the narrow track, vomiting ceases, and the patient, who has all through preserved his appetite, regains strength and condition. Then, started perhaps by some error of diet, the intestinal troubles reappear, the patient loses both weight and strength. In cases where diarrhœa is unduly severe, with marked colonic obstruction, death usually supervenes rapidly.

The diagnosis, usually easy, is confirmed by Ivrag treatment, essentially of a surgical nature, is both difficult and complicated. The simultaneous involvement of three component parts of the gastro-intestinal canal—stomach, jejunum, and colon—in a debilitated subject provides us with one of the most embarrassing problems in abdominal surgery. A study of the published end-results of operative

procedures undertaken for the relief of this condition shows a high percentage of recurrences. Simple excision of the lesion is insufficient : one must direct one's attention to a modification of the *milieu* in which the ulcer has developed, and is likely to redevelop. We are faced with the problem of a reconstitution of three parts of the alimentary canal in a patient of poor risk, and with an "ulcer-predisposition."

Symptomatic procedures, such as simple liberation of the fistulous loops, with or without excision of the jejunal ulcer, leave unchanged the conditions under which the ulcer developed, and leave the patient exposed to the chance of recurrence. The direct treatment of the fistula must be supplemented as far as possible by a return to the physiological *status quo ante* : this means the suppression of the original gastro-enterostomy. Whether this can be done or not depends on the state of the pylorus, and on the presence of either a gastric or a duodenal ulcer, still in an active state.

Several possibilities have to be considered :

1. With a patent pylorus, and a healed gastric or duodenal ulcer, one is free to undo the gastro-enterostomy.
2. With a patent pylorus, and a still active duodenal ulcer, if the excision of this ulcer does not interfere with the evacuation of stomach-content, one may here undo the gastro-enterostomy
3. With a patent pylorus, but a still active gastric ulcer, it is preferable either to leave the anastomosis *in situ*, or to re-form the gastro-enterostomy, seeing that excision of gastric ulcer unaccompanied by gastro-enterostomy does not give good results.
4. With a pylorus no longer patent, whether due to pathological stenosis or operative exclusion, two alternatives present themselves, viz., either the refashioning of the gastro-enterostomy, or else some form of gastrectomy (in the hope of lowering the acid content ; a wide pylorectomy will obtain the desired result in a durable manner.

Operation, no matter of what type, is only to be regarded as a preliminary stage in the patient's treatment : it must be supplemented by radical treatment of all possible foci of infection, and followed by a prolonged anti-acid after-treatment.

WM. DOOLIN.

SINGER (Vienna) : *Medical Treatment of Jejunal Ulcer*. ("Med. Klin." 1921, xvii., 521.)

JEJUNAL ulcer is a relatively frequent complication of gastro-enterostomy. In 1910, at a period when its existence was less well recognised than to-day, von Eiselsberg reported 8 cases in 600 gastric operations. In a more recent statistical report (Nov., 1920) it is alleged

to ensue in 13% of operations for duodenal ulcer. It is found almost exclusively following gastro-enterostomy with occlusion of the pylorus in cases of gastric and duodenal ulceration. Clinically, it betrays itself as a rule by very acute symptoms, usually tumultuous hæmorrhage or perforation; it may show the typical picture of a gastro- or jejuno-colic fistula, viz., fœcal vomiting diarrhœa, extreme emaciation, all of which explain the fact that hitherto its treatment has been purely surgical.

Diagnosis of a latent jejunal ulcer is extremely difficult, even with the *x*-rays. So much so, that Singer is of the opinion that many patients who suffer from painful symptoms following gastro-enterostomy and are relieved by careful dietetic regime, are in reality suffering from an unrecognised jejunal ulcer. These considerations, together with the undoubted gravity of further surgical interference in debilitated subjects, led him to try the effect of a purely medical treatment. This consists essentially in absolute rest, milk diet, and right lateral decubitus after the intake of food. Notes of these cases personally treated are added, in which a favourable result was obtained. All had recurrence of pain, vomiting and hæmorrhage within two years of the gastro-enterostomy. One had an undoubted gastro-colic fistula (confirmed by *x*-ray). Medical treatment extended up to three months.

WM. DOOLIN.

BEER (Königsberg): *Rapid Fatal Recurrence of Jejunal Ulcer*. ("Ziebett. J. Chir." 1922. No. 9, p. 282.)

BEER gives a detailed account of a patient, 29 years old, who was admitted to hospital with a four years' history of epigastric pain; no vomiting, hyperacidity, *x*-ray negative. Operation (22 6 '20) disclosed a duodenal ulcer: this was "included" with a circular suture, and a posterior gastro-enterostomy performed. For a year afterwards there was complete freedom from abdominal trouble. On the 6th October, 1921 readmitted to hospital on account of severe epigastric pain, profuse hæmotemesis, marked anæmia, and pressure tenderness just above umbilicus. Free HCl 40. Combined acids 58. X-ray showed normal function at anastomotic site. At operation (14 10 '21) a small ulcer was found in the efferent jejunal loop, on its posterior wall; this loop was universally adherent to mesocolon. Pylorus patent. Jejunal loops excised just below gastro-enterostomy site, (inclusive of ulcer area), and an end-to-end anastomosis of gut performed; then a complete excision of the pyloric half of the stomach was performed, carrying with it the gastro-enterostomy site; an end-to-side anastomosis between cardiac portion of stomach, and reconstituted jejunal loop completed the operation. Within three weeks, further signs of trouble developed, pain, and hæmatemesis, for which latter a blood transfusion was carried out (2/11/'21). Mors.

Post-mortem examination disclosed the formation of a fresh perfo-

rating jejunal ulcer, as large as a five-mark piece ; on its floor was an eroded branch of the left colic vein, from which had come the fatal hæmorrhage.

In recording this case, the author draws attention to the remarkably rapid recurrence and growth of the second jejunal ulcer ; he recalls the particular tendency, noticed by v. Eiselsberg and v. Naberer, of pyloric exclusion as a predisposing factor in the genesis of this condition. In this particular case, the second jejunal ulcer occurred at the site of application of a clamp during the second operation. Silk sutures were used to effect the anastomosis.

WM. DOOLIN.

BAINBRIDGE, W. S. : *Operation in Advanced Cancer*. "Medical Record." October 19th, 1921.

BAINBRIDGE deals with cases of advanced cancer dealt with by operative measures. The cases were amongst those usually regarded as quite unsuitable for operation, but by his published results the ends have amply justified his judgment. We hope the author will at some future date deal with cases in which he considers operation is not desirable for he must have met many cases which, though no worse than those described, have not given satisfactory results.

H. S.

FINDLAY, L. : *The Present-day Conditions—Social, Medical, and Political—in Vienna*. "Glasgow Medical Journal." October, 1921.

LAST Easter the author spent a few weeks in Vienna, with the object of investigating the prevalence of rickets and also of studying the actual medical, social and political conditions in that city.

In spite of the very deficient fat-content of the diets of most of the inhabitants there did not appear to be any increase in the incidence of the ordinary type of rickets, but late rickets was undoubtedly more common. The author was impressed by the apparent good health of the vast majority of the children which he saw. The death rate in Vienna is now much higher than in pre-war days, the cause of this being privation and shortage of food. These hardships fell especially on the upper classes who depended on a fixed income, salary or pension. Conditions were tending to get worse rather than better. When the author was in Vienna the state of the exchange was 2,800 kronen to £1.

The author (who does not regard rickets as a nutritional disease) thinks that the accounts of a great increase in the prevalence of rickets in Vienna are not based on facts, but are largely written for political objects and as a plea for foreign help in the feeding of the children. However, he has to admit that at the time when he visited Vienna

the conditions there were very bad indeed, and that a very large proportion of the population was on the brink of starvation.

V. M. SYNGE.

BARKMAN, A. : *Case of Brain Tumour (operated on) with Paresis of the Proximal muscles of the arm, Disturbances of Bladder Function of Cortical origin, neuritis of the Acoustic Nerve, without Choked Disc, occurring in a Woman Suffering from Nephritis, and in whom a Brain Abscess developed after Operation.* "Acta Medica Scandinavica." 23rd August, 1921.

THE author records a case of an intra-cranial tumour in a woman aged 55. There was vomiting, headache, but no optic neuritis. Convulsive attacks occurred involving the left arm and leg, which were in a state of spastic paresis and also showed sensory changes. At operation an almost spherical tumour, about two inches in diameter, was easily shelled out. It was pressing on the right frontal lobe.

Barkman discusses the differential diagnosis in this case between a brain tumour and uræmic manifestations, as the patient was also suffering from chronic nephritis with a blood pressure of 200 mm. Hg. He emphasises the importance of increased sensibility to percussion over the part of the skull in the region of the tumour. In this case there was at first slight wasting of the proximal muscles of the arm, but some time after the operation a well-marked atrophy limited to the small muscles of the left hand developed. This was, in the author's opinion, due to pressure on the cortical centres, resulting from a brain abscess which occurred after the operation. He quotes Pierre Marie and Oppenheim as having also noted the occurrence in cerebral lesions of atrophy limited to the small muscles of the hand. Barkman thinks that it is a valuable sign pointing to cerebral involvement, a sign to which sufficient attention has not been drawn in text-books.

Lastly he draws attention to the neuritis of the eighth nerve, due apparently to general increase of intra-cranial pressure, and not to be taken as a localising sign in a case of brain tumour.

V. M. SYNGE.

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# TRANSACTIONS.

## ROYAL ACADEMY OF MEDICINE IN IRELAND.

### SECTION OF STATE MEDICINE.

A meeting of this section was held on March 24, 1922, with the President, DR. T. HENNESSY, in the chair.

DR. J. W. BIGGER read a paper on "Milk and the Public Health." Artificial feeding of infants introduced a great number of dangers which were not present in breast feeding. Cow's milk differed chemically from human, but its constitution could be modified so as to render it a suitable food. The great danger in the use of cow's milk was the presence of bacteria which might come from disease of the cow, disease of the milker or from the addition of cow's fæces to the milk. Tuberculosis was the most important disease of the cow transmissible to man, and 8% of Dublin milks were found to contain tubercle bacilli. Tubercle free herds were essential, and these could be secured by routine tuberculin tests. Repeated veterinary inspection of the cows and medical inspection of the workers could prevent any great epidemics of infectious disease due to milk. Infantile diarrhoea, from which 382 deaths occurred in Dublin last year, was probably the most fatal disease due to milk. Its cause was to be found in dirt, chiefly in cow's fæces. An examination of one hundred Dublin milks showed that they were grossly contaminated, but comparably to the milks of other cities in which no regulations as to the cleanliness of milk were in force. Clean conditions at the time of milking and the thorough cleansing and sterilising of milk vessels would secure clean milk. An experiment at a farm was described. By the adoption of simple precautions to prevent the access of dirt to the milk, and without special apparatus, it was found possible to reduce the number of bacteria to about one-thirtieth of those present under the old conditions. The time taken by this clean milk to sour was about three times as long as before the institution of the clean conditions, about 185 hours on an average. Dr. Bigger advocated a scheme for the supplying of pure certified milk, similar to those in England and the United States and also of the fixing of maximum standards of bacterial contamination. He appealed to the members of the Academy to impress on their patients the importance and the practicability of clean milk and the dangers of dirty milk.

SIR ANDREW HORNE mentioned the gradual evolution of infant feeding from the time when he was a student in the Rotunda Hospital, where a large number of wet nurses were employed, through the various stages of bottle feeding. He contrasted the high infant mortality

rate of Dublin with the very low rate of the poorest counties in the West of Ireland. In his experience, cow's milk was a dangerous food for infants during the summer months and dried milk was used by him. The effect of government control on Denmark pointed to the necessity of similar schemes for the securing of clean milk in Ireland.

DR. ELLA WEBB said that there was no really satisfactory substitute for fresh clean cow's milk. She had not been successful in the use of dried milks, and preferred condensed milk supplemented by cod liver oil, orange juice and raw eggs. In her opinion tuberculosis in cows was greatly increased by keeping them in the city during the winter. An important factor in the spread of infantile diarrhoea was the dirty condition of the city. She believed that the supplying of certified milk would not solve the pure milk problem, as such milk would be too expensive for the poor, and suggested that milk vendors should have a licence, as difficult to procure as that of a public-house, and that only a satisfactory clean milk should be permitted to be sold.

DR. T. T. O'FARRELL pointed out the absurdity of examining a milk for the presence of typhoid or diphtheria bacilli several weeks after the commencement of an outbreak of these diseases, and advocated repeated medical inspection of the workers supported by bacteriological examination of throat swabs, etc., as the best way of controlling milk epidemics. He suggested as a useful test of the conditions of milk production, an estimation of the dirt present.

DR. SOLOMONS gave some experiences of his work in a Baby Club and pointed out that when a baby was given clean milk from the Model Farm that it did well, but when it was put on a bought milk it lost weight and suffered from diarrhoea. He mentioned that in his experience maternity nurses delighted in bottle feeding. He was pessimistic as to the possibility of a pure milk supply, and thought pasteurisation a more practicable step.

THE MASTER OF THE ROTUNDA (DR. FITZGIBBON) asked if the danger lay with the bacteria or with their poisonous products in the milk. He believed that town dairies were very beneficial, as their milk could be obtained fresh. During the summer months he used unsweetened condensed milk, which he found more satisfactory than dried milk. In cases of diarrhoea it was important to examine the conditions under which the milk was kept in the home. Vessels and bottles were often filthy, even in good-class houses.

SIR JOHN MOORE explained that the connection between the outbreak of infantile diarrhoea and the temperature four feet under ground was due to the onset of a plague of flies. He mentioned the filthy conditions of the milk churns at the railway stations.

THE PRESIDENT thought it well to consider the industrial aspect of the milk trade. Irish dairy cattle have been sacrificed to beef, and the Limerick cow has been replaced by the shorthorn, which is very prone to acquire tuberculosis. He advocated a model farm in every

county, and the elevation of the position of the milker. In his opinion the breeding of goats was desirable.

DR. KIRKPATRICK said that the people did not want clean milk, and would not, until the dangers of dirty milk were pointed out to them. It was disgraceful that not a single hospital in Dublin insisted on having clean milk. He also mentioned the unsatisfactory way in which other foods, particularly bread, were distributed.

MR. DE BURCA stated that frequently milk was sold in shops at a very cheap rate, but that this was milk which was on the point of turning sour.

SIR JOHN LUMSDEN thought it deplorable that infantile mortality could be prevented, but that nothing was done to prevent it. It was essential to have a clean milk supply.

DR. BIGGER, in his reply, stated that the experiences of London and other cities showed that clean milk was possible, but that the medical profession must educate the public to demand it.

## SECTION OF PATHOLOGY.

### *Ovarian Pregnancy.*

A meeting of this Section was held on Friday, March 31st, 1922 the PRESIDENT, DR. O'KELLY, in the chair.

DR. LANE showed a specimen of ovarian pregnancy. The patient had menstruated three weeks before admission and came in as a possible case of appendicitis. On operation a clot containing the fœtus was found in the abdomen which had evidently come from a sac which was visible in the ovary. The operation was performed by Sir William Taylor in the Meath Hospital.

DR. ROWLETTE expressed interest in the recording of another case of ovarian pregnancy, which he believed to be only the second recorded in Dublin. The case appeared to be a genuine one.

MR. HENRY STOKES had been present at the operation. The tubes were quite intact, but there was a hole about the size of a shilling in the back of the right ovary.

### *Tuberculous Kidney.*

DR. LANE also showed a tuberculous kidney from a woman. No tubercle bacilli were found, although there was a variable amount of pus in the urine. An x-ray examination showed a shadow which appeared to be a stone. On operation no stone was found, but the kidney was in an advanced condition of tuberculous pyelonephritis.

DR. BOXWELL, who had seen the case in the Meath Hospital, reported that a cystoscopic examination showed that at that time no urine was coming from that kidney. The operation was done because of the diagnosis of stone.

*Two Cases of Supposed Influenzal Pneumonia.*

PROF. BOXWELL showed specimens of two cases in which the diagnosis had been one of influenzal pneumonia, and in which post-mortem examination showed advanced tuberculosis.

The first was a girl who was sent in to the hospital at the height of the epidemic. She had a high temperature, some hæmaturia, much blood in the sputum, but no tubercle bacilli. In this case the lungs showed milliary tuberculosis, afterwards honeycombed with multiple abscesses. The kidneys showed multiple hæmorrhagic infarcts. These infarcts were obviously derived from clots in the left ventricle, which were found to contain mixed cocci and were attached to the wall over a area of endocarditis. He believed it to be a genuine case of influenza, but that the patient had been previously suffering from tuberculosis, and that a secondary infection had produced the abscesses in the lungs, septic clots in the heart, and subsequent infarcts.

The second case was a policeman sent in as a case of influenza. He had pains in the bones, and was weak and ill, but had no rise of temperature from the time of admission for eight days. The temperature then rose, and severe hæmoptysis set in. This fever lasted for eight days. There was then an intermission followed by another rise of temperature, the second lung being then found to be affected. This fever settled down, but the patient was very weak. He had a transfusion of blood, but received no benefit. A few days later he died, after having bled profusely from the lungs for a fortnight. The post mortem gave evidence of well-established tuberculosis, there was tuberculous broncho-pneumonia and fibrosis, with much clotted blood, due to the profuse hæmorrhage.

Tubercle bacilli, although repeatedly searched for, were never found during life.

DR. T. T. O'FARRELL had just done a post mortem on a patient of 17 or 18 years of age. She began to vomit five days before admission. The temperature on admission was 105, and she was comatose all the time she was in hospital. She died in three days. Extensive hæmorrhages were found in the cavities of the body and in the brain and meninges. This case also was supposed to be one of influenza.

DR. ROWLETTE pointed out that these were examples of the way in which influenza lighted up pre-existing tuberculosis, a circumstance which has not always been recognised.

The exhibits were also discussed by the PRESIDENT.

*An Outbreak of Bacterial Food Poisoning.*

THE PRESIDENT (DR. W. D. O'KELLY) read a paper on an outbreak of bacterial food poisoning, due to the bacillus enteritidis of Gærtner

which occurred in October, 1921. The outbreak took place in an institution, at least 150 out of 170 of the inmates in one block of the building being affected. With the exception of a few servants, no other members of the institution got ill. The only article of food not common to the occupants on the day on which the outbreak started was porridge and milk at breakfast. This was served only to the occupants of the affected block. The symptoms were headache, vomiting, nausea, abdominal pain, and diarrhœa, with a temperature reaching in some cases 104 F.

No death occurred, convalescence was rapid, and no after effects were observed. The average incubation period was about 25 hours.

In searching for the source of infection of the milk which was regarded as the vehicle, it was found that one of the servants attached to the institution had suffered from an attack of gastro-enteritis a week previously. This servant was not attached to the kitchen, but worked in an adjoining portion of the building. It was suggested that this man was responsible for the infection of the milk, either indirectly, through flies carrying the organism from a lavatory used by the servants which was about 50 yards distant from the room in which the milk for porridge was set aside, or directly by infecting the milk with soiled hands. It was not established that he was in the habit of taking milk from this supply, but he had access to it, and this alternative hypothesis was put forward.

Gärtner's bacillus was recovered from three out of four samples of fœces from victims of the outbreak, but the fœces of the servant who was regarded as the temporary carrier gave a negative finding. His fœces were only obtained with difficulty some six weeks after his recovery. The blood of some of the victims and that of the servant carrier, collected during the outbreak, possessed agglutinins for Gärtner's bacillus in low dilutions. Some weeks later fresh samples of blood yielded higher titres. The organism isolated behaved on culture media like other members of the *Salmonella* group. It agglutinated with an anti-Gärtner serum, and was pathogenic for mice.

The servants attached to the institution, with the exception of five who had access to the milk served with the porridge, escaped infection, although they used the peccant milk at their breakfast. Their escape was explained by the fact that the milk had been added to the tea in bulk, and experiments carried out by Dr. O'Kelly showed that the temperature to which the organisms were exposed was sufficient to kill them.

This was the second outbreak of bacterial food poisoning recorded in Ireland, and another interesting feature was the vehicle, only nine outbreaks in which milk was at fault being collected by Savage in the British cases, and none in the Continental records.

(This investigation was carried out under a grant from the Medical Research Council.)

DR. BIGGER congratulated the Section and its President on the paper. He pointed out the rarity of food poisoning outbreaks in Ireland, and in all places the rarity of milk poisoning. He enquired why the porridge was ruled out, pointing out that it was often cooked the previous day and heated for breakfast. Milk kept for 24 hours should never be used raw with porridge.

DR. ROWLETTE referred to an outbreak which occurred a few years ago among the nurses of a Dublin hospital. In that case he had failed to find the causal organism. It was a festival, and part of the feast consisted of cream pastry which had been made the previous day and kept in a rather stuffy pantry. This "cream" was made of beaten eggs and cream whipped together raw. None of it had been left over, so that it could not be examined. To celebrate the festival wine was also supplied, and it was an interesting observation that all the nurses and students who had taken a glass of sherry with the cream puffs escaped the poisoning, whilst all the others suffered severely.

DR. KIRKPATRICK suggested that the time of year made it unlikely that the infection in the President's cases was carried by flies, and the distance appeared to be rather far, unless there was some definite reason, such as a prevailing wind.

DR. O'FARRELL also spoke, and the PRESIDENT replied.

#### SECTION OF MEDICINE.

A meeting of this section was held on the 3rd March, 1922, SIR JAMES CRAIG in the chair.

DR. H. C. DRURY showed specimens from a boy of 17 who was admitted to hospital with vomiting, shivering and pain in the right ear. He was delirious and jaundiced on admission. Sir Robert Woods found no evidence of disease in the ear, but nevertheless suspected it as the cause of his condition. Blood culture revealed streptococci, and the case ran a rapidly fatal course. At autopsy extensive middle ear disease was found with mastoid involvement, subdural abscess, and thrombosis of the lateral sinus. The absence of ear findings was a most important and instructive point.

DR. G. E. NESBITT reported the post-mortem findings in a case of suspected intra-cranial tumour with evidence of pituitary insufficiency which he had exhibited previously to the Section (November, 1921).

MR. A. K. HENRY, who had operated twice on the pituitary in this case, described his method, and demonstrated his own ingenious instrument for pituitary operations.

MR. A. A. MCCONNELL demonstrated the brain and illustrated the condition by drawings. The case turned out to be one of internal hydrocephalus, due to obliteration of the aqueduct of Sylvius. There was considerable dilatation of the third and lateral ventricles which were filled with blood. The pituitary fossa was normal, but the gland had been destroyed by the two operations, the instrument having entered the fossa with perfect accuracy. There was a small tear in the floor of the third ventricle. Mr. McConnell expressed regret that owing to the pronounced features of pituitary insufficiency, supported by the x-ray findings, he had not first performed ventriculography, which would probably have rendered the conditions quite clear.

Death was apparently due to a diffuse choroidal hæmorrhage which followed a sudden relief of intraventricular pressure.

*Prognosis in Mental Disease.*

DR. H. R. C. RUTHERFORD read a paper on Prognosis in Mental Disease. (See p. 65.)

For purposes of comparison, the author made a classification of states, instead of entities. He divided them into four types—depression, excitement, confusion, and delusional.

An analysis had been made of 157 recoveries. A depression state was present in 63 cases. The general recovery rate, as estimated upon the admissions, had worked out at 43·13%. Permanence of recovery was not to be found, as a rule, in mental disease, owing to the influence of heredity. Heredity was usually to be discerned in from 50% to 70% of admissions. This heredity he regarded as being purely of a hypo-thyroidal nature. He had come to this belief by the large number of patients, with an early psychopathic inheritance, who responded to thyroid treatment. Especially was this to be noticed in cases showing a family history of collateral heredity. The later hypo-thyroidal generations showed dementia præcox and imbecility, which conditions were accompanied by degenerative changes, or undevelopment, and these the late administration of thyroid could not remove.

He commented upon the influence of thyroid in the organism's growth, and suggested that the want of durability in degenerated tissues was due to deficient thyroid, so that when strain came the affected organ failed.

Hypo-thyroidism only acted as a predisposing cause, but whenever the exciting cause of the mental attack was a feeble one, the administration of thyroid would remove it.

There was a marked association in both the insane and their relatives, of tuberculosis, asthma, and malignant disease. The author suggested

that defective thyroidal secretions might act as an hereditary and predisposing cause in these diseases also.

*Discussion on Dr. Rutherford's Paper.*

DR. W. F. LAW commented on the bad prognosis of cases with systematised delusions or marked hallucinations. He had seen a considerable amount of insanity amongst the natives of British Guiana, and had pointed out some years ago that general paralysis, though rather rare, was in these races almost always associated with early dementia, sometimes with melancholia, and rarely with exaltation. He attributed the difference to their inferior mental development.

DR. G. E. NESBITT thought that Dr. Rutherford's theory of hypothyroidism in relation to inheritance of insanity and other familial diseases was of extreme importance and worthy of thorough investigation. He had long felt that minor disturbances or defects of character or disposition might be attributable to ductless gland disturbance, and he hoped they might soon be amenable to treatment by appropriate extracts.

DR. W. M. CROFTON said that the excretion of micro-organisms in the urine of insane patients was very common, and that the treatment of their mental disease might be approached along these lines. The action of thyroid might be to break a vicious circle.

DR. L. ABRAHAMSON suggested that other glands than the thyroid might be involved.

DR. R. J. ROWLETTE was not clear as to what was meant by an heredity family history. Some type of defect could be found in some member of almost every family.

DR. J. S. ASHE reminded the Section that Frankl, of Vienna, in his lectures to the Academy last year had dwelt on the importance of disturbance of the hormone balance. From the pharmacological point of view potassium iodide had by no means the same effect as thyroid extract.

DR. H. C. DRURY referred to a former paper of his own on the subject of prognosis, in which he had pointed out numerous pitfalls. Prognosis in mental disease seemed even more difficult, and he thought the general physician would be wise to avoid the necessity, if possible.

DR. RUTHERFORD, in reply, said that he hoped to publish his results with thyroid—some of which had been very remarkable—especially those with excitement. The proper dosage was a matter of considerable difficulty. Infections of all sorts, especially intestinal, were very common in the insane, and he thought, due largely to the hypothyroid state. The thyroid, and occasionally the supra-renal, were the only glands which had given him results.



*The Treatment of Some Acute Infections.*

DR. CROFTON read a paper on this subject illustrated by lantern slides of the charts of patients, on the treatment of active immunisation of acute infections. He discussed the theory of this method of treatment, suggesting it was always possible, so long as the endothelial cells of the blood-vessels were intact. The cases described comprised acute bronchopneumonia, empyema of the knee-joint, acute thoracic infection after gunshot wounds, septicæmias following gunshot wounds of the limbs, puerperal fever, and acute pneumonic phthisis. The surgical cases had of course received appropriate surgical treatment. These cases were chosen as illustrations because they were all quite obviously in imminent danger of losing their lives—they all had made complete recoveries.

DR. T. P. C. KIRKPATRICK said he had seen many of the cases, and he could testify that the results were as satisfactory as had been stated. There was always difficulty in judging the relationship of cause and effect, but he felt justified in saying that the patients were distinctly benefited, and that certainly there were no harmful results. The patients themselves appreciated it. He thought that acute or advanced forms of tuberculosis did not seem to react in the same satisfactory fashion as other forms of infection.

DR. G. E. NESBITT thought the charts exhibited were less convincing than the opinions expressed, as they did not differ very materially from those of similar cases treated by other methods. Those from cases of puerperal sepsis were the most striking, and in this condition the method of treatment had given good results with other workers also. The production of reaction which had to be "controlled" by subsequent employment of obscure chemical remedies seemed inconsistent, and in this connection he invited an opinion on "detoxicated" vaccines. He asked also for some information about the "diphtheroids" which figured so frequently in bacteriological reports.

DR. R. J. ROWLETTE had experience mainly of two types of cases—puerperal sepsis and infected wounds. In the Rotunda Hospital the use of vaccines in puerperal cases had given some remarkable results. They had never done harm, and although there were failures, the general opinion was that they were distinctly helpful. Ten years ago he had reported two cases treated at the same time with streptococcus vaccine—one did well (an undoubted streptococcus infection), the other died and it was found to be a case of staphylococcus aureus infection! He had not met *B. coli* as a cause of puerperal sepsis; it was nearly always streptococcal, and this was the most serious type. His practice differed from that of Dr. Crofton in that he employed the most suspicious organism present, and his doses were larger. He had also obtained good results in a certain number of septic wounds, which compared well with those treated by other means.

DR. CROFTON, in reply, said that probably 90% of his cases would not have recovered, and he thought that he had been very fortunate. No limbs had been lost in spite of very serious septic injuries. His main object was to show that the method could be used with perfect safety in acute cases. The "diphtheroids" were a very virulent though heterogenous group, which passed through various phases on culture, and frequently developed streptothrix forms. He objected to "stock" vaccines except during the preparation of an autogenous one, and he regarded "detoxicated" vaccines as the antithesis of what an antigen ought to be. He agreed that *B. coli* was rare in puerperal cases. He used every organism present, as it was generally impossible to say which was pathogenic.

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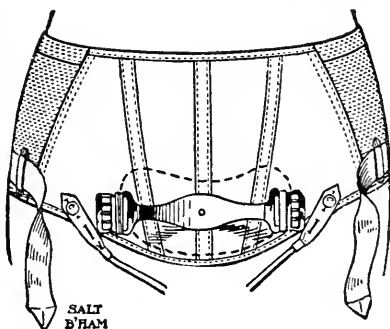
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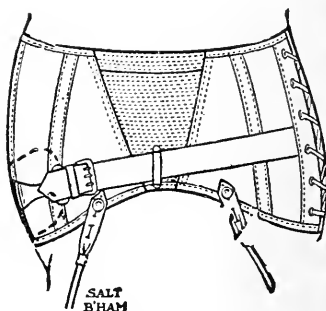
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# **THE IRISH JOURNAL OF MEDICAL SCIENCE.**

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The following editorial announcement appeared in our issue of March, 1922 :—

In March, 1920, the DUBLIN JOURNAL OF MEDICAL SCIENCE became the organ of the Royal Academy of Medicine in Ireland.

At a General Meeting of that Academy on April 12th, 1922, it was decided that the name of the Journal should be changed to the IRISH JOURNAL OF MEDICAL SCIENCE, and that the name be printed in Irish and in English.\* It is impossible without regret to do any customary thing, however trivial, for the last time, and the change in title of this old and famous Journal (though it has indeed been modified in the past) is not lightly made. But the Journal, with its proud associations, thus becomes in name what it has long been in fact, the mouthpiece of Irish medicine.

Graves and Stokes were its first co-editors, and they are associated wherever medical science is taught or is practised throughout the world, less with a school or a city than with the country which bore them. If we forget the towns which claimed the birth of Homer, we still remember that he was a Greek.

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\* A new block is being prepared for the cover and title-page in accordance with this decision.

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